

Dear Parents,

Below is information regarding Unit 2, Expressions & Equations. Look for additional information for future units.

### Expressions & Equations

By the end of this unit, students will understand that:

- Variables can be used to represent numbers in any type mathematical problem.
- Understand the difference between an expression, an equation, and an inequality.
- Expressions are simplified and equations are solved for the variable's value.
- Write and solve multi-step equations including all rational numbers.
- Expressions, equations, and inequalities can be used to represent and solve real world problems

### Vocabulary

**Algebraic Expression:** an expression consisting of at least one variable and also consists of numbers and operations

**Numerical Expression:** an expression consisting of numbers and operations

**Coefficient:** the number part of a term that includes a variable. For example, 3 is the coefficient of the term  $3x$

**Constant:** a quantity having a fixed value that does not change or vary, such as a number. For example, 5 is the constant of  $x + 5$

**Equation:** a mathematical sentence formed by setting two expressions equal

**Inequality:** a mathematical sentence formed by placing inequality symbols ( $>$ ,  $<$ ,  $\geq$ , or  $\leq$ ) between two expressions.

**Term:** a number, a variable, or a product and a number and variable.

**Variable:** a symbol, usually a letter, which is used to represent one or more numbers.

Try: <http://intermath.coe.uga.edu/>

### Textbook Connection

**McGraw Hill Georgia Math 6 Plus:** Chapter 10 Lessons 1-6;  
Chapter 11 Lessons 1-8

### Web Resources

<http://www.purplemath.com/modules/solvein.htm>

[http://www.algebralab.org/lessons/lesson.aspx?file=algebra\\_onevariabletwo-step.xml](http://www.algebralab.org/lessons/lesson.aspx?file=algebra_onevariabletwo-step.xml)

<https://www.ixl.com/math/grade-7/solve-two-step-equations>

<http://www.mathgoodies.com/lessons/vol7/equations.html>

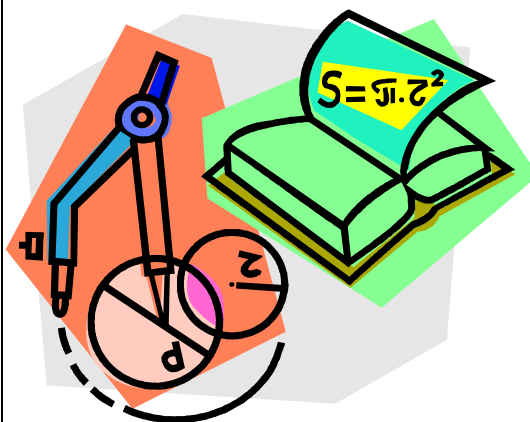
<http://www.math.com/school/subject2/lessons/S2U1L3GL.html>

<http://www.math.com/school/subject2/practice/S2U1L3/S2U1L3Pract.html>

<http://www.homeschoolmath.net/teaching/teach-solve-word-problems.php>

<http://www.aaamath.com/equ725x7.htm>

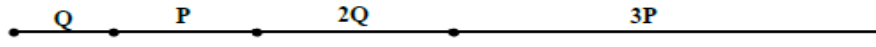
<http://education.jlab.org/sminequality/index.html>



## USING ALGEBRAIC PROPERTIES

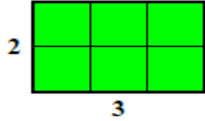
Models for addition and subtracting of variables (combining like terms).

▪ Picture model  $\odot \odot \odot + \rightarrow \rightarrow + \odot \odot \odot = 7\odot + 2\rightarrow$

▪ Linear model 

The length of the line is  $q + p + 2q + 3p = 3q + 4p$  in length.

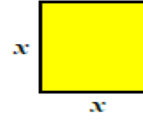
Models for multiplication of variables



$(2)(3) = 6 \text{ sq units}$



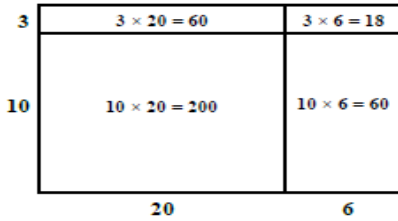
$(x)(y) = xy$



$(x)(x) = x^2$

Models for the distributive property/factoring

$$\begin{array}{r} 13 \\ \times 26 \\ \hline 78 \\ 260 \\ \hline 338 \end{array}$$



Examine the distributive shown above.

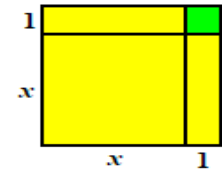
$13 \times 6 = 6(10 + 3) \text{ or } 60 + 18$

$13 \times 20 = 20(10 + 3) \text{ or } 200 + 60$



...and now with symbols

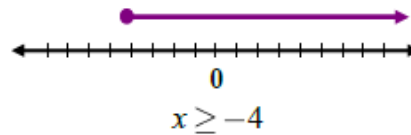
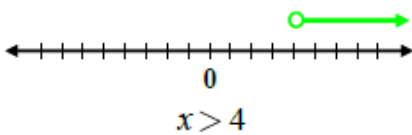
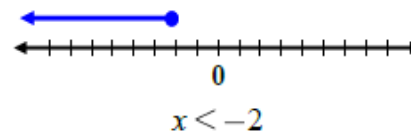
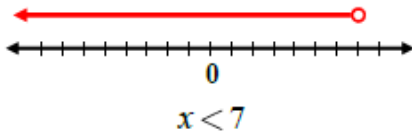
$3(x+2) = 3x + 6$



$(x+1)(x+1) = x^2 + 2x + 1$

## Graphing Inequalities on a Number Line:

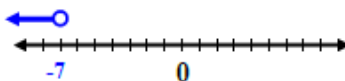
The following are examples of graphing the inequalities  $<$ ,  $\leq$ ,  $>$ , and  $\geq$  on a number line.



Solve and graph the following inequalities.

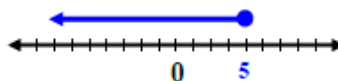
1.  $2b + 4 < -10$

$$\begin{array}{r} -4 \quad -4 \\ \underline{2b} < \underline{-14} \\ 2 \quad 2 \\ b < -7 \end{array}$$



2.  $12 \leq 3b - 3$

$$\begin{array}{r} +3 \quad +3 \\ \underline{15} \leq \underline{3b} \\ 3 \quad 3 \\ 5 \leq b \end{array}$$



3.  $-b - 6 < -2$

$$\begin{array}{r} +6 \quad +6 \\ \underline{-b} > \underline{4} \quad \text{divide by } -1, \text{ change the sign} \\ -1 \quad -1 \\ b > -4 \end{array}$$

